QUARTERLY PROGRESS REPORT

Project Title:	Project 2001-15, Technical Solutions to Overcrowded Park & Ride Facilities
RFP NUMBER: NJDOT 2001-15	NJDOT RESEARCH PROJECT MANAGER: Edward Conrad
TASK ORDER NUMBER/Study Number:	PRINCIPAL INVESTIGATOR: Dr. Kyriacos C. Mouskos
Period Starting: 01/02/2002	Period Ending: 12/31/2002
Ending Date: 06/30/2003 - extended	

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10	10	90	9.0
1.	20	20	60	12.0
2.	15	25	40	6.0
3.	15	15	90	13.5
4.	20	45	50	10.0
5	10	25	25	2.5
Final Report	10	0	0	0
TOTAL	100%			53.0%

1. Progress this quarter by task:

Literature Search	*Presentation of Summary Search Results. Discussion to Support and Refine the Project Tasks* **Technologies for ingress and egress to/from parking facilities surveyed: Inductive Loop detectors, Video Image Processing, Acoustic Detector. The literature review will be available on the TIDE's web site by mid-summer.** **A review of Park and Ride Facilities in the US and Canada is continuing. A preliminary report has been developed and will be submitted to NJDOT during the 4th quarter.** **A review of parking reservation systems is almost completed: Work will continue though until the end of the project** **A review of parking payment systems is continuing** **A review of parking guidance systems is continuing**
Task 1	Report on Needs Assessment Analysis for NJDOT's Park & Rides Program **The Clinton Point park and Ride Facility will be the first site that will be surveyed by the end of the fourth quarter.** **A NJDOT Access Database of Park and Ride Facilities for North Jersey has been reviewed. A Park & Rides database model is under development.**
Task 2	*Data collection for NJDOT Park & Ride locations.* Memorandum of Park and Ride Database, and Analytical Findings Infrastructure, traffic control and traffic flow data per park and ride facility will be recorded into an Access database. **An additional questionnaire for users of park and ride facilities will be completed and will be distributed at some facilities. The data collection on selected park and ride facilities will be undertaken during the 4th and 5th quarters.**

Task 3	Report on Park & Ride monitoring systems • A review of the technologies under development or reviewed by the researchers at the TIDE center will also be documented under this task (Dr. Niver, Dr. Mouskos and one research assistant). Literature review is nearing completion • The literature review on planning/management/demand modeling will be undertaken by Dr. Boile and Dr. Mouskos and two research assistants. Literature review is nearing completion • Literature review on parking payment systems, monitoring systems and parking information and reservation systems will be undertaken by Dr. Mouskos, Dr. Holguin-Veras, Dr. Tavantzis (NJIT-TIDE) and one research assistant. Literature review is nearing completion • A cost analysis of traffic monitoring systems will be undertaken by Dr. Holguin-Veras with the assistance of Dr. Mouskos. Cost data on traffic monitoring systems is continuing
Task 4	*A Park & Rides Planning/Management/Approach for NJDOT* • Report on an arrival/departure forecasting system per park and ride existing location, • Report on a real-time parking space availability and parking cost information system • Report on parking payment systems • Report on parking reservation systems • Report on maintenance and operations • A planning model for the identification of future park and ride facility needs. A report outlining a comprehensive planning model that will capture the intermodal and dynamic characteristics of park and ride facilities subject to parking space availability in real time and travelers's choices (automobile only, transit only and intermodal (park & ride). • *A set of New Jersey Transit park and ride facilities located near the I-80 corridor have been geocoded into the TRANSCAD software. A set of bus and train lines and transfer stations have also been incorporated into the intermodal planning model. Work will continue until the end of the project* • The product of this proposed task will be software, which will analyze traffic on intermodal corridors and will determine the effects of parking, transit and congestion information provided to drivers, on corridor performance. **Nothing to report**
Task 5	*Integration of the Park and Ride planning/information model with VISTA (Dr. Ziliaskopoulos, Dr. Boile, Dr. Mouskos, Dr. Holguin-Veras)* A prototype integration of the NJDOT Park and Ride facilities databases into VISTA A prototype implementation of the intermodal planning model (Task 4) within VISTA **The North Jersey Transportation Planning Authority's planning data used for their planning model have been acquired and a process for integration with the GIS-based TRANSCAD software is continuing.**
Task 6	Quarterly progress reports, and final report with appropriate tables, graphs and chart in hard copy version, pdf file format, Word 97 and CD ROM. **Fourth quarterly report is due on December 31, 2002.**

2. Proposed activities for next quarter by task

Literature Search	*Presentation of Summary Search Results. Discussion to Support and Refine the Project Tasks* **Technologies for ingress and egress to/from parking facilities surveyed: Inductive Loop detectors, Video Image Processing, Acoustic Detector – First draft completed.** **A review of Park and Ride Facilities in the US and Canada will continue – First draft completed** **A review of parking reservation systems will continue – First draft completed** **A review of parking payment systems will continue – First draft completed**

	A review of parking guidance systems will continue – First draft completed **Final draft will be submitted at the end of the project**
Task 1	Report on Needs Assessment Analysis for NJDOT's Park & Rides Program This task was delayed and will be completed during the 4th and 5th quarters. **The results of the first interviews of NJDOT managers on Park and ride facilities will be reported.** **A preliminary list of potential needs for NJDOT park and ride facilities will be prepared.** **Additional elements to be included in NJDOT Access database for Park and Ride facilities will be identified.**
Task 2	*Data collection for NJDOT Park & Ride locations.* Memorandum of Park and Ride Database, and Analytical Findings Infrastructure, traffic control and traffic flow data per park and ride facility will be recorded into an Access database. **Data collection for NJDOT Park and Ride Locations will start based on the list provided by NJDOT for the I-80 corridor as well as additional facilities. The data collection will be completed during the 4th and 5th quarters.** **The Clinton Point Park and Ride facility will be the first to be analyzed in detail.**
Task 3	Report on Park & Ride monitoring systems • A review of the technologies under development or reviewed by the researchers at the TIDE center will also be documented under this task (Dr. Niver, Dr. Mouskos and one research assistant). **First Draft completed, work will continue until the end of the project** • The literature review on planning/management/demand modeling will be undertaken by Dr. Boile and Dr. Mouskos and two research assistants. First Draft completed, work will continue until the end of the project • Literature review on parking payment systems, monitoring systems and parking information and reservation systems will be undertaken by Dr. Mouskos, Dr. Holguin-Veras, Dr. Tavantzis (NJIT-TIDE) and one research assistant. **First Draft completed, work will continue until the end of the project** • A cost analysis of traffic monitoring systems will be undertaken by Dr. Holguin-Veras with the assistance of Dr. Mouskos. **First draft will be submitted at the end of the 5th quarter**
Task 4	*A Park & Rides Planning/Management/Approach for NJDOT* • Report on an arrival/departure forecasting system per park and ride existing location, **An arrival/departure forecasting system for NJIT's parking deck will be presented that will provide daily ingress/egress traffic flow profiles. This methodology will be extended to other NJDOT facilities that have ingress/egress detectors in place.** • Report on a real-time parking space availability and parking cost information system, • Report on parking payment systems • Report on parking reservation systems **An algorithm to solve the parking equilibrium problem will be developed** • Report on maintenance and operations **Data will be collected on maintenance and operations of NJDOT park and ride facilities.** • A planning model for the identification of future park and ride facility needs. A report outlining a comprehensive planning model that will capture the intermodal and dynamic characteristics of park and ride facilities subject to parking space availability in real time and travelers's choices (automobile only, transit only and intermodal (park & ride). **The first version of the intermodal planning model will be presented** • *The product of this proposed task will be a prototype intermodal planning model, implemented on the I-80 corridor, which will be able to analyze traffic on intermodal corridors and will determine the effects of parking, transit and congestion information provided to drivers, on corridor performance*.
Task 5	*Integration of the Park and Ride planning/information model with VISTA (Dr. Ziliaskopoulos, Dr. Boile, Dr. Mouskos, Dr. Holguin-Veras)* A prototype integration of the NJDOT Park and Ride facilities databases into VISTA

	A prototype implementation of the intermodal planning model (Task 4) within VISTA **Nothing to report**
Task 6	Quarterly progress reports, and final report with appropriate tables, graphs and chart in hard copy version, pdf file format, Word 97 and CD ROM. **Fifth quarterly report is due on March 31, 2003.**

3. List of deliverables provided in this quarter by task (product date)

Publications:

- Bernstein, D., Mouskos, K.C., and J. Tavantzis, "Implementation of the Barrier Method to Solve the Parking Spatial Price Equilibrium Problem," submitted for consideration to the Transportation Research Part C transportation journal.
- Sun Wu, K.C. Mouskos and D. Bernstein "A Web-Based Parking Information and Reservation System," Accepted for presentation to the 2003 Annual Transportation Research Board Meeting, Washington, DC.
- Mouskos, K.C., D. Bernstein, and J. Tavantzis, "An Integer Linear Programming Formulation of Deterministic and Stochastic parking Reservation Systems (PRS) with Fixed Costs," submitted to the Transportation Research Part C Journal, March, 2002.
- Mouskos, K.C., D. Bernstein, and J. Tavantzis, "An Integer Linear Programming Formulation of Deterministic and Stochastic parking Reservation Systems (PRS) with Fixed Costs," presented at the annual Transportation Research Board meeting, January, 2002; published at the TRB CD-ROM.

Working Papers:

Bernstein, D., Mouskos, K.C., and J. Tavantzis, "Solution Algorithms to Solve the Spatial Price Equilibrium Problem," expected to be completed by March, 2003 and submitted for publication at a transportation journal.

Development of a web-based parking reservation system. The first version of the web-based system is nearing completion and will be available during the 5th quarter.

Pilot Test of a parking payment system

The pilot test has been postponed until a final agreement is reached by the City of Newark and Mobipower Ltd. (formerly Teleparking Systems). Meetings will continue between the TIDE center, Mobipower and the City of Newark.

4. Progress on Implementation and Training Activities

A training on the VISTA system which will be used to implement the intermodal planning model will take place on the 12th and 13th of December at NJIT as part of the NJDOT project "Development of a DTA/simulation planning model for the NJDOT I-80 ITS Priority Corridor"

5. Problems/Proposed Solutions

A no-cost extension was requested until June 30, 2003.

6. Budget Summary

N/A

Total Project Budget(# of years)	

Total Project Budget(# of years) - 1 year	$54,733
Total Project Expenditure to date	$15,117
% of Total Project Budget Expended	28%
Task Order Number/Study Number:	RF-CUNY 18
Current Task Order Budget (# of years)	1 year
Actual Expenditure to date against current task order	$15,117
% of current task order budget expended	28%